THE CIRCULATION OF PRINCE WILLIAM SOUND

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16. Abstract

The objectives of this project are to determine the feasibility of studying surface circulation in coastal waters using surface visible properties observed on ERTS-1 imagery and to study surface water circulation in the Prince William Sound region. This is accomplished by intercomparisons between features observed on ERTS-1 imagery and circulation patterns deduced from oceanographic data.

No new cloud-free ERTS data have been acquired during the reporting period, due to combined winter darkness and poor weather over the study region. It has therefore been impossible to fulfill the above objectives during the reporting period, and there are no new results to report.

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CONTENTS

I - INTRODUCTION

This report summarizes the work performed and conclusions reached during the second six months of contract NAS5-21833, ERTS-1 project 110-9 The Circulation of Prince William Sound.

During the second six months of this project, oceanographic baseline data in the form of subsurface and surface water temperature, salinity, color and suspended sediment load have been obtained at two times; during March and May 1973. These data are currently undergoing processing. While insufficient funds are presently available to adequately analyze these data, along with data obtained during the previous six month reporting period, it is hoped that a study proposed to the University of Alaska Sea Grant Program will provide funds for data analysis.

No usable ERTS data have been obtained from the study area during the second six months of the project, nor were data obtained during the final two months of the first six months of the project. This lack of data is due to a combination of: (1) winter darkness; and (2) poor weather conditions leading to excessive cloud cover over the study region.

The total lack of ERTS data have made it impossible to obtain any results or conclusions from the project during the second six months reporting period of this project.

II - STATUS OF PROJECT

A. Objectives

Overall project objectives are to determine the feasibility of investigating the surface circulation of coastal waters using the distribution of a purely visible surface parameter as derived from ERTS imagery and, in the event that such feasibility is positively established, to study the surface circulation in the Prince William Sound, Alaska region.

The immediate objectives of the second reporting period were to procure and analyze ERTS data in such a way as to accomplish project objectives.

B. Accomplishments during the reporting period

1. Preliminary investigations

Oceanographic cruises have been made to the study region, to obtain baseline data, during March and May of the current six month reporting period. These data are now being processed. Oceanographic data obtained during December 1972 and January 1973 (the preceding six month reporting period) have been processed. The acquisition and processing of these

"ground-truth" data were supported financially by other (non-ERTS) projects as planned in the original ERTS-A proposal. Similarly, it is hoped that a proposed study submitted to the University of Alaska Sea Grant Program will provide funds to adequately analyze the oceanographic data within the next 18 months.

2. Applicability of ERTS-1 data to project objectives

No suitable ERTS data have been obtained from the study region during the present six month period, and only one ERTS scene at very low sun angle was acquired during the first six month period. It is therefore difficult to determine the applicability of ERTS data to project objectives. The fact that suitable data have not been obtained suggests, however, that ERTS with an 18-day coverage cycle may not be a suitable tool for study of surface parameters in a region (such as the study area) which is characterized by darkness, poor weather and concurrent cloud cover during a major part of the year.

3. Results

No ERTS data have been obtained during the present six month reporting period, nor are there sufficient funds currently available for adequate analysis of the oceanographic baseline data. There are, consequently, no results during this reporting period.

III - NEW TECHNOLOGY

None

IV - PLANS FOR NEXT REPORTING PERIOD

See item VI below

V - CONCLUSIONS

It is tentatively concluded, on the admittedly negative basis of a lack of data, that ERTS-1 is an unsuitable tool for studying surface marine processes in a region characterized by very low sun angles in winter and frequent cloud cover in summer. The inability of ERTS to sense through even a relatively thin cloud cover is aggravated by its infrequent overpasses. The probability of obtaining usable imagery is thus reduced to a low level.

VI - RECOMMENDATIONS

Insufficient ERTS imagery of Prince William Sound have been obtained to allow meeting of project objectives. Furthermore, the normal climatic trend for the study region suggests that chances of obtaining usable data during the rest of the summer and fall seasons do not warrant continued investment of time and money on this project. Therefore we recommend that the University of Alaska ERTS-1 project 110-9 be placed in an inactive status, with

no further expense of project funds, until such time as suitable ERTS-1 imagery of the study area becomes available.

VII - PUBLICATIONS

None

VIII- REFERENCES

None

APPENDIX A - CHANGE IN STANDING ORDER FORMS

None

APPENDIX B - ERTS DATA REQUEST FORMS

None

APPENDIX C - ERTS IMAGE DESCRIPTOR FORMS

None, as no usable ERTS data received

APPENDIX D - SIGNIFICENT RESULTS

Due to a complete lack of usable ERTS data, no significant results have been obtained during the past two-month reporting period.